Applied A.I. Solutions

Data Visualization Techniques

Professor

Daniel Vitaver, EMBA

daniel.vitaver@georgebrown.ca

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DATA VISUALIZATION TECHNIQUES

Parameters and Calculated Fields

https://www.youtube.com/watch?v=Xk9HnpmWtsU

TABLEAU – Parameters

Parameters are useful when you want:

- to add interactivity and flexibility to a report, or
- to experiment with what-if scenarios

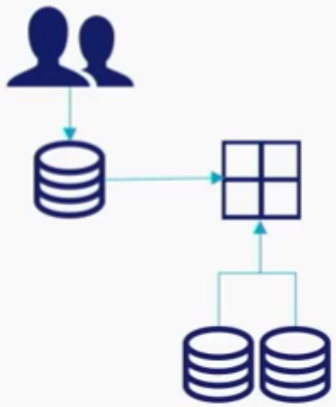
When you use parameters, you need to tie them to the view in some way:

- Use parameters in calculations and calculated fields used in the view
- Display the parameter control in the view for users to select parameters
- Reference parameters in parameter actions

https://help.tableau.com/current/pro/desktop/en-us/changing-views-using-parameters.htm

TABLEAU – Parameters

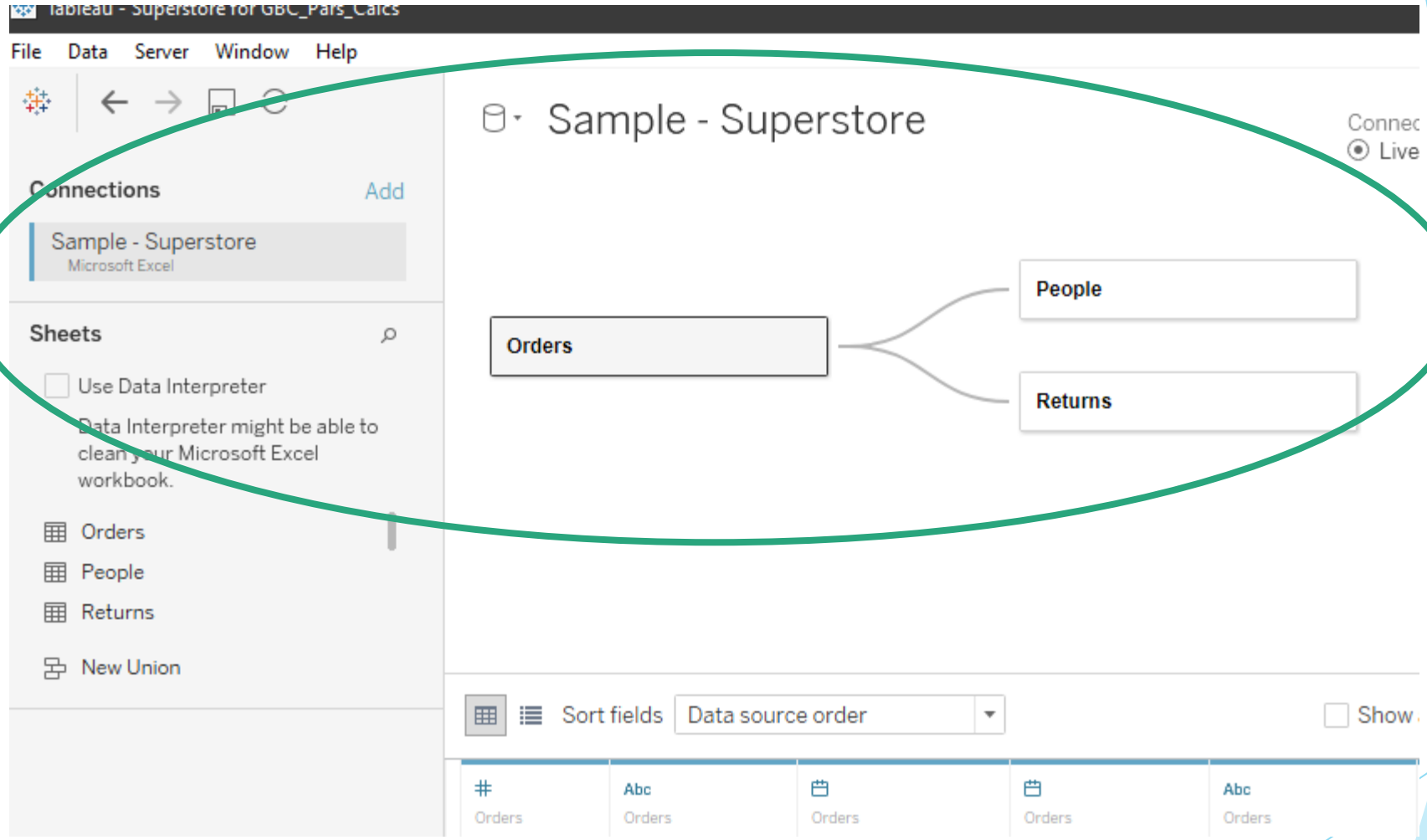
What Is a Parameter?



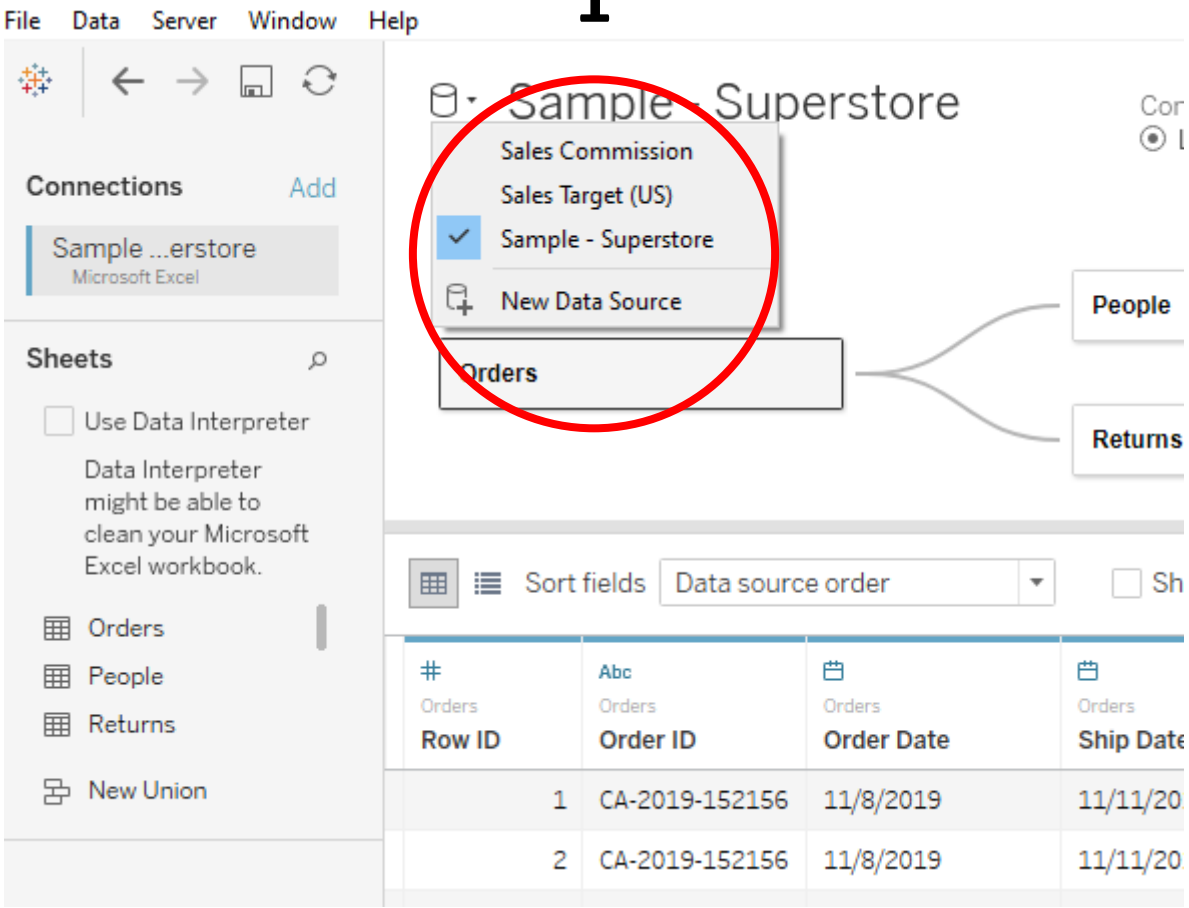
- **User Input**
  - A way of letting users specify a value
  - A "variable" in programming speak
  - Useful for What-If? Analysis
- **Data Source**
  - Params are fields
  - Live in a special data source
  - Can be used in calculations, etc.

https://help.tableau.com/current/pro/desktop/en-us/changing-views-using-parameters.htm

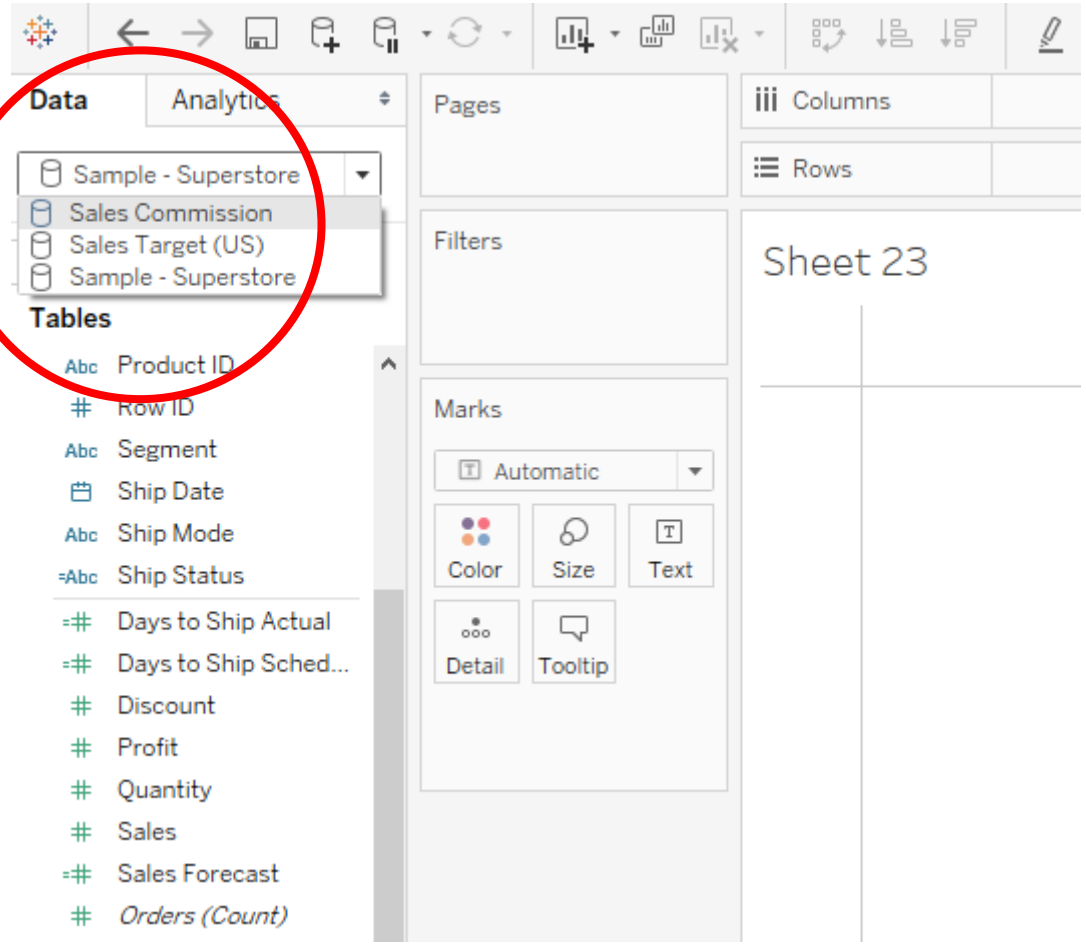
1


File Data Server Window Help
Sample - Superstore
Connections
Add
Sample - Superstore
Microsoft Excel
Sheets
Use Data Interpreter
Data Interpreter might be able to clean your Microsoft Excel workbook.
Orders
People
Returns
New Union
Orders
People
Returns
Sort fields
Data source order
Show

1

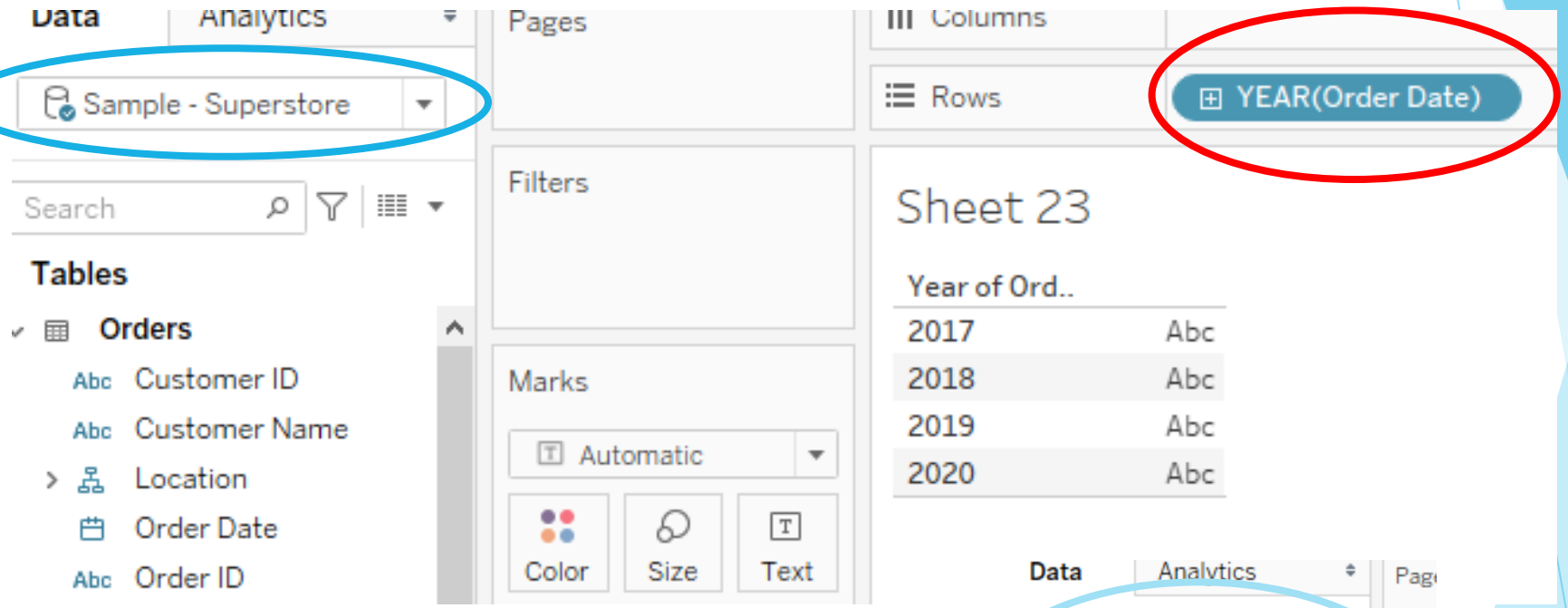

File
Data
Server
Window
Help
Connections
Add
Sample ...erstore
Microsoft Excel
Sheets
Use Data Interpreter
Data Interpreter might be able to clean your Microsoft Excel workbook.
Orders
People
Returns
New Union
Sample - Superstore
Sales Commission
Sales Target (US)
Sample - Superstore
New Data Source
Orders
People
Returns
Sort fields
Data source order
Orders
Row ID
Orders
Order ID
Orders
Order Date
Orders
Ship Date
1
CA-2019-152156
11/8/2019
2
CA-2019-152156
11/8/2019

1

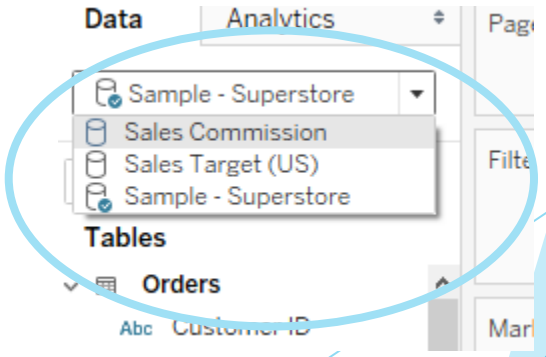

Data
Analytics
Sample - Superstore
Sales Commission
Sales Target (US)
Sample - Superstore
Tables
Abc Product ID
Row ID
Abc Segment
Ship Date
Abc Ship Mode
Abc Ship Status
Days to Ship Actual
Days to Ship Sched...
Discount
Profit
Quantity
Sales
Sales Forecast
Orders (Count)
Pages
Filters
Marks
Automatic
Color
Size
Text
Detail
Tooltip
Columns
Rows
Sheet 23

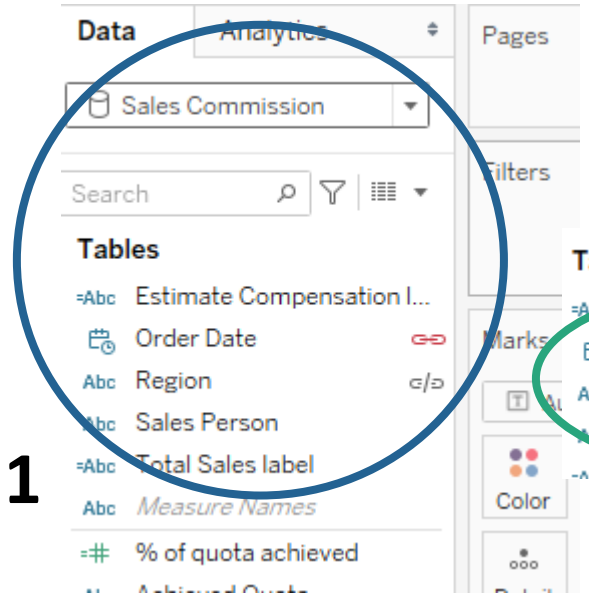
1

2

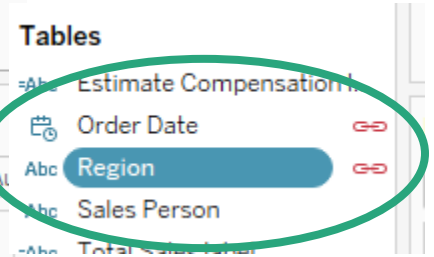

Data
Analytics
Pages
Columns
Sample - Superstore
Rows
YEAR(Order Date)
Search
Filters
Tables
Orders
Customer ID
Customer Name
Location
Order Date
Order ID
Marks
Automatic
Color
Size
Text
Sheet 23
Year of Ord..
2017 Abc
2018 Abc
2019 Abc
2020 Abc

3

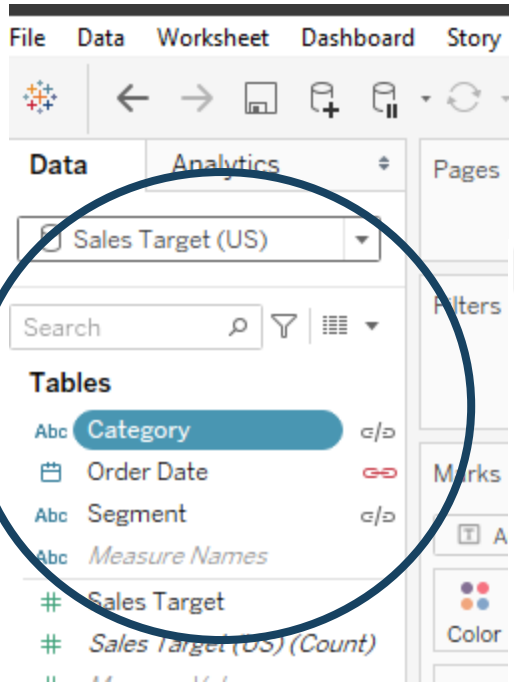

Data
Analytics
Sample - Superstore
Sales Commission
Sales Target (US)
Sample - Superstore
Tables
Orders


Data
Analytics
Pages
Sales Commission
Search
Tables
Estimate Compensation I...
Order Date
Region
Sales Person
Total Sales label
Measure Names
% of quota achieved
Filters
Marks
Color

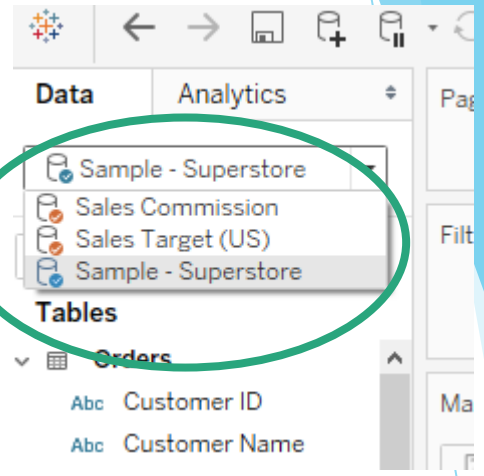
1


Tables
Order Date
Region
Sales Person

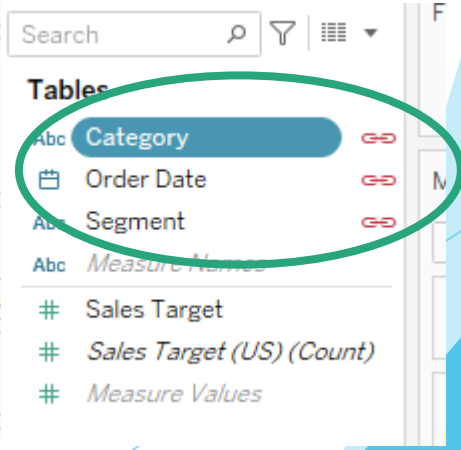
2


File
Data
Worksheet
Dashboard
Story
Data
Analytics
Pages
Sales Target (US)
Search
Tables
Category
Order Date
Segment
Measure Names
Sales Target
Sales Target (US) (Count)
Filters
Marks
Color

3

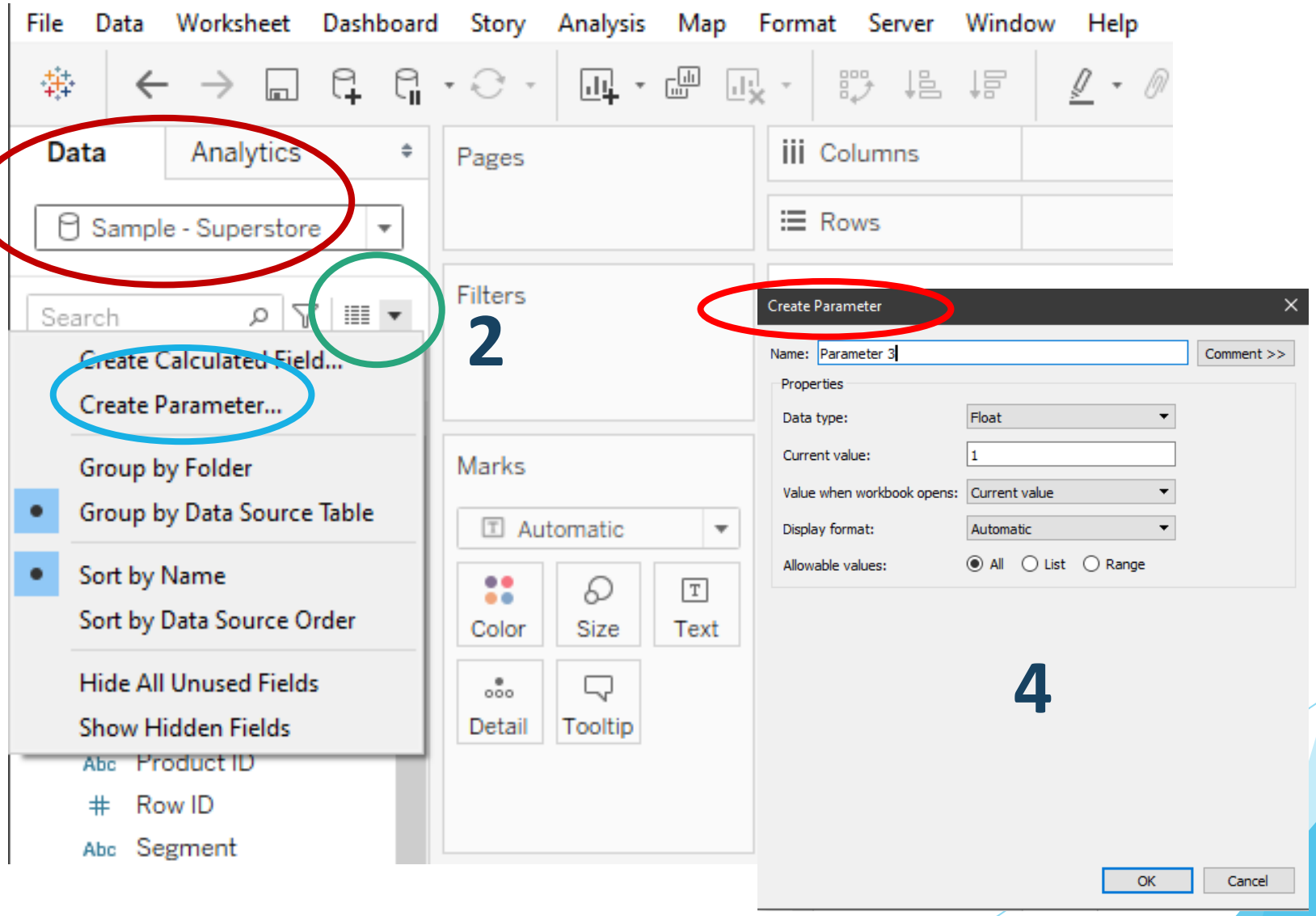

Data
Analytics
Sample - Superstore
Sales Commission
Sales Target (US)
Sample - Superstore
Tables
Orders
Customer ID
Customer Name

5


Search
Tables
Category
Order Date
Segment
Sales Target
Sales Target (US) (Count)
Measure Values

4

TABLEAU – Parameters



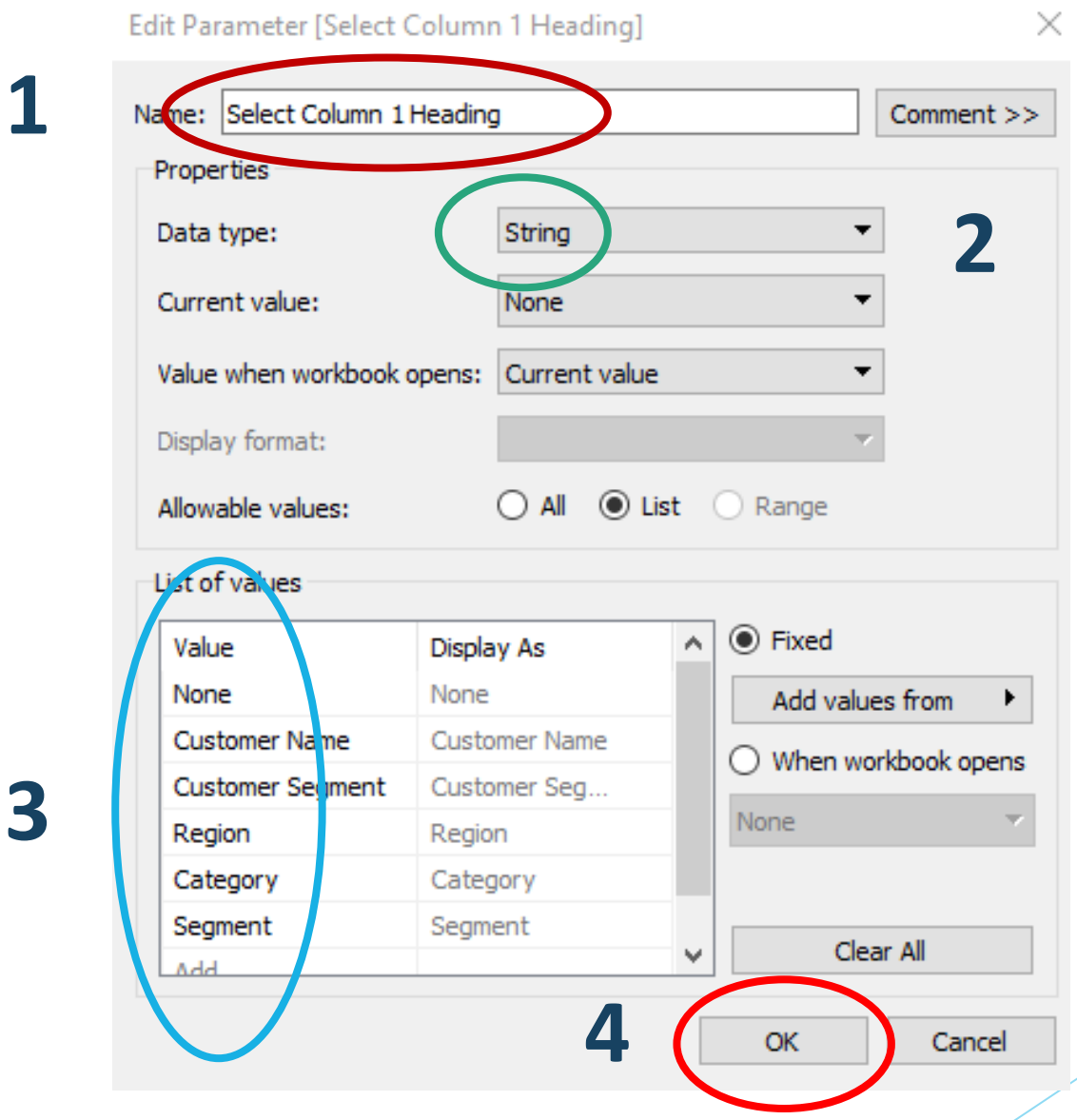
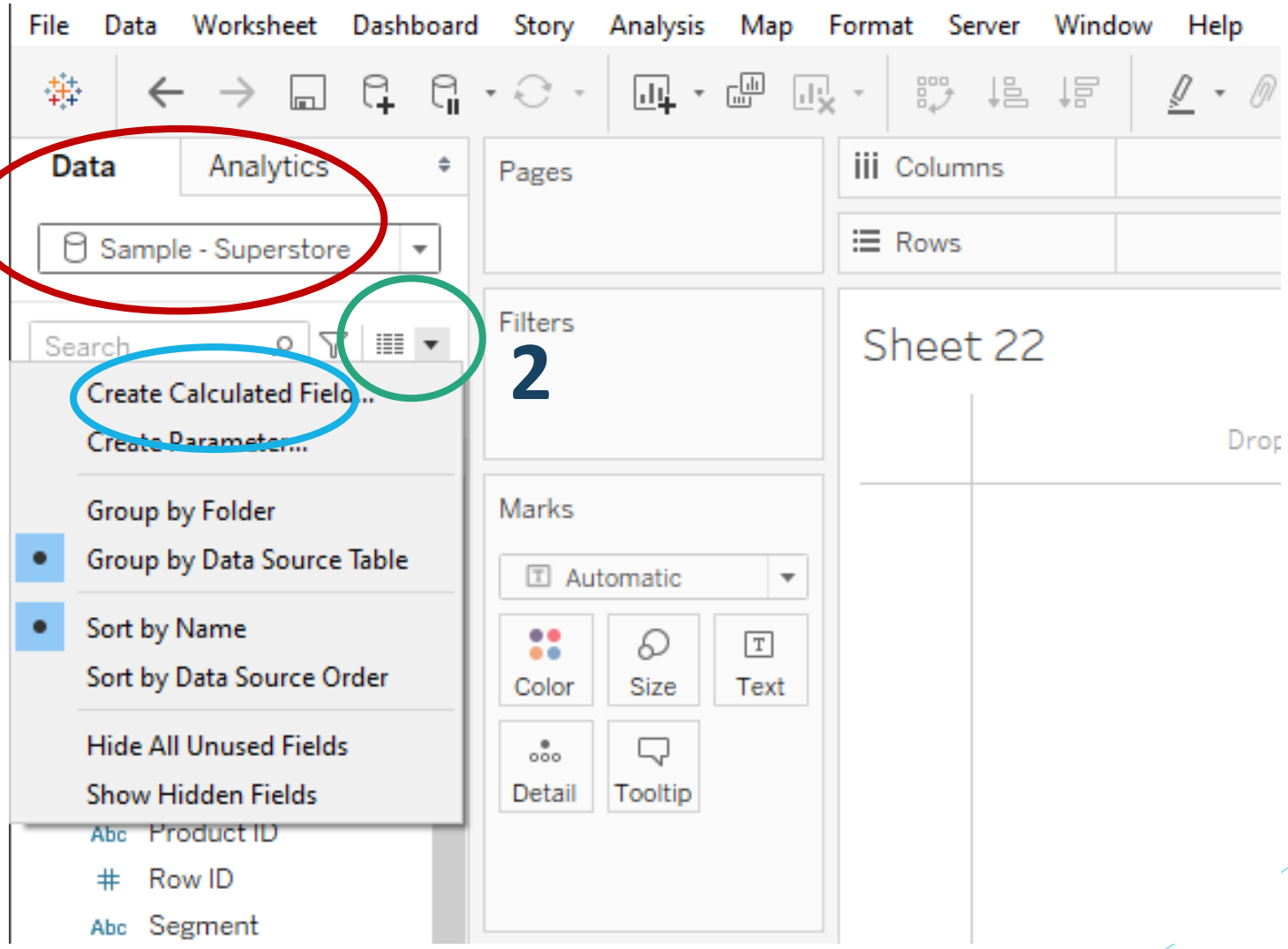
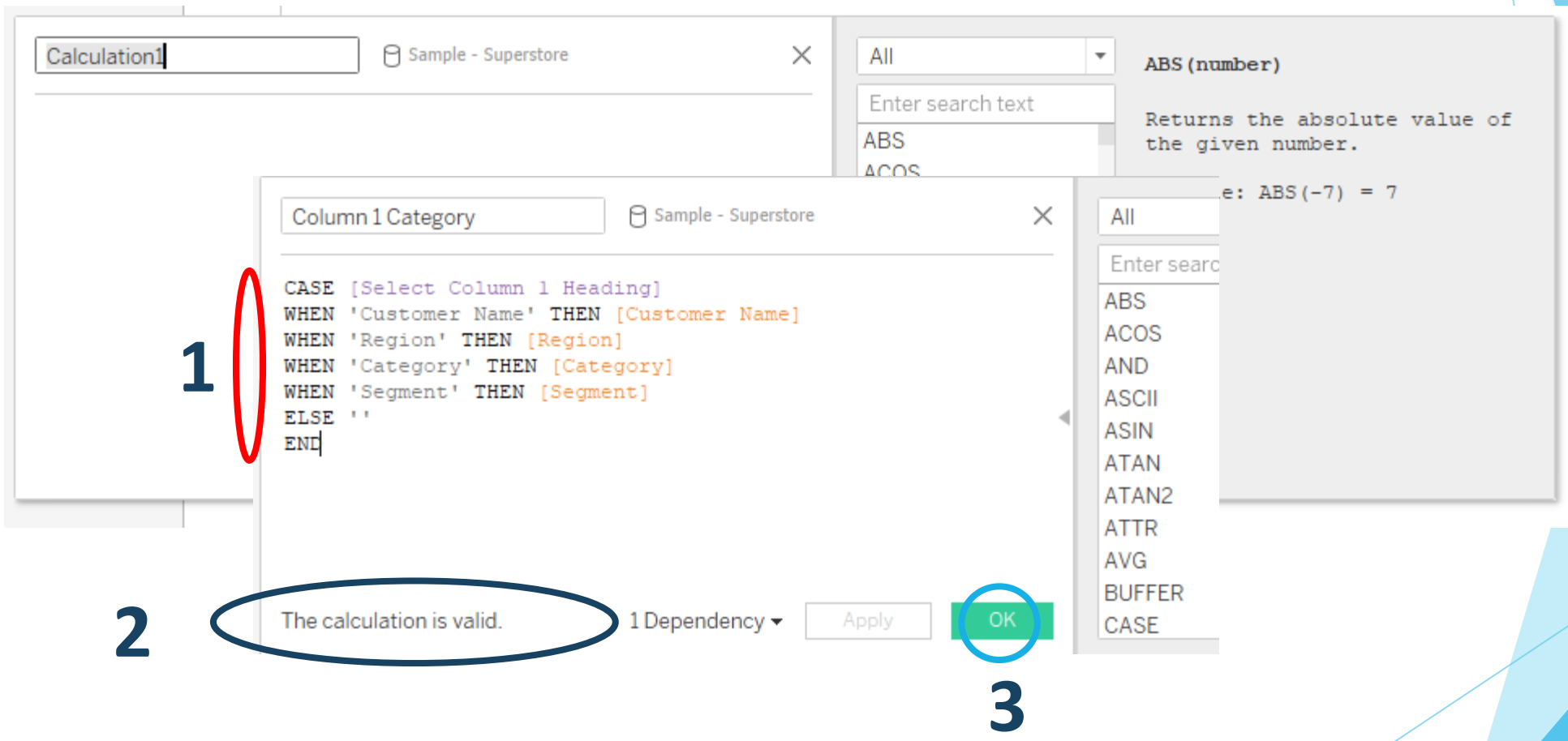
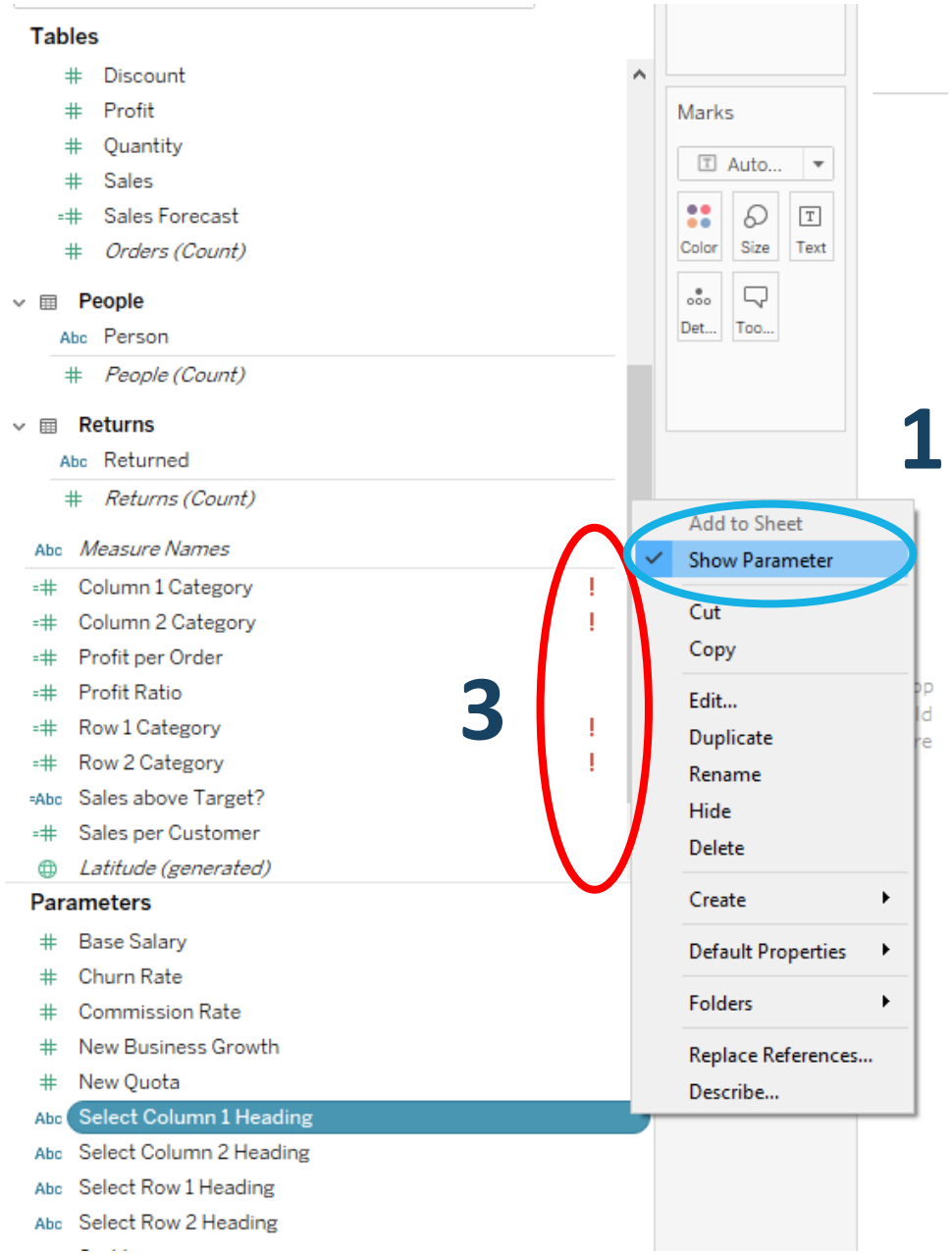
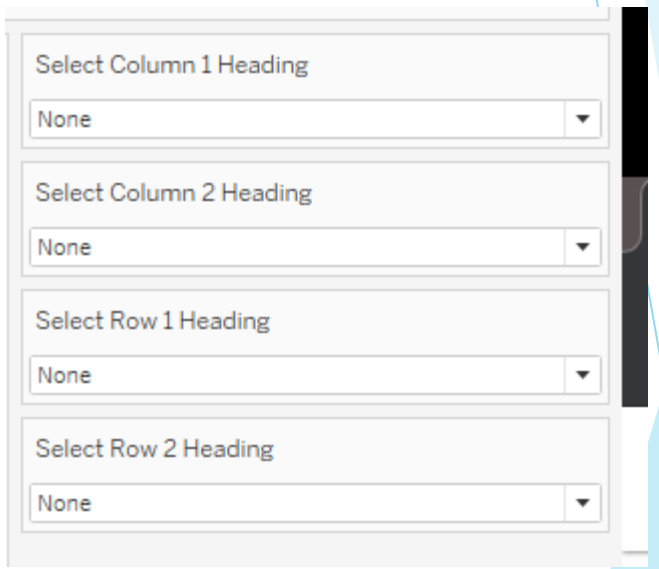

Edit Parameter [Select Column 1 Heading]
1
Name: Select Column 1 Heading
Comment >>
Properties
Data type: String
2
Current value: None
Value when workbook opens: Current value
Display format:
Allowable values: All List Range
List of values
Value Display As
None None
Customer Name Customer Name
Customer Segment Customer Seg...
Region Region
Category Category
Segment Segment
Add
Fixed
Add values from
When workbook opens
None
Clear All
3
4
OK
Cancel

TABLEAU – Parameters




Calculation1
Sample - Superstore
All
Enter search text
ABS
ACOS
ABS(number)
Returns the absolute value of the given number.
e: ABS(-7) = 7
Column 1 Category
Sample - Superstore
CASE [Select Column 1 Heading]
WHEN 'Customer Name' THEN [Customer Name]
WHEN 'Region' THEN [Region]
WHEN 'Category' THEN [Category]
WHEN 'Segment' THEN [Segment]
ELSE ''
END
All
Enter searc
ABS
ACOS
AND
ASCII
ASIN
ATAN
ATAN2
ATTR
AVG
BUFFER
CASE
1
2
The calculation is valid.
1 Dependency
Apply
OK
3


Tables
Discount
Profit
Quantity
Sales
Sales Forecast
Orders (Count)
People
Person
People (Count)
Returns
Returned
Returns (Count)
Measure Names
Column 1 Category
Column 2 Category
Profit per Order
Profit Ratio
Row 1 Category
Row 2 Category
Sales above Target?
Sales per Customer
Latitude (generated)
Parameters
Base Salary
Churn Rate
Commission Rate
New Business Growth
New Quota
Select Column 1 Heading
Select Column 2 Heading
Select Row 1 Heading
Select Row 2 Heading
Marks
Auto...
Color
Size
Text
Det...
Too...
Add to Sheet
Show Parameter
Cut
Copy
Edit...
Duplicate
Rename
Hide
Delete
Create
Default Properties
Folders
Replace References...
Describe...
1
2
3


Select Column 1 Heading
None
Select Column 2 Heading
None
Select Row 1 Heading
None
Select Row 2 Heading
None

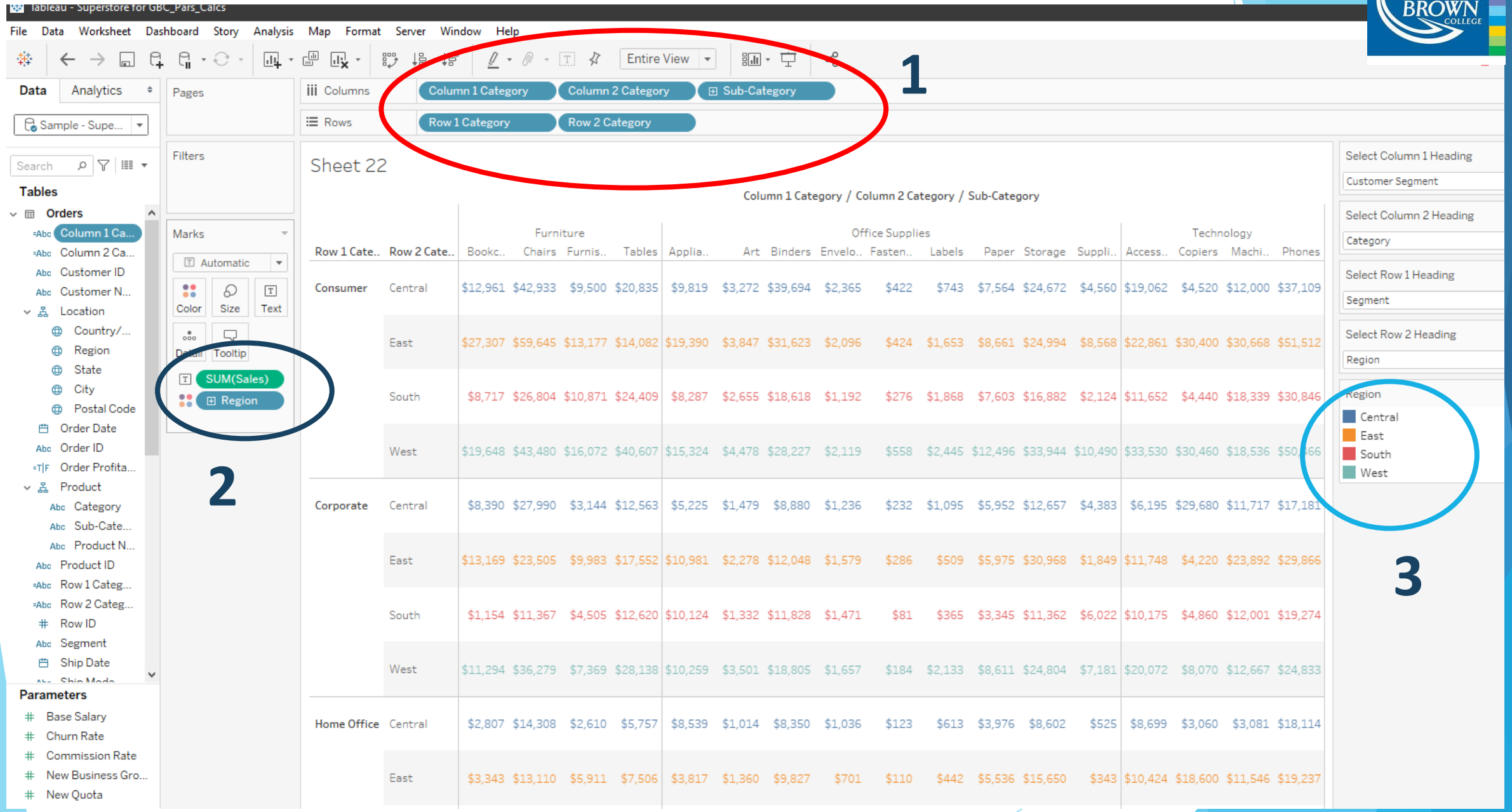


Tableau - Superstore for GBC_Pars_Calcs
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Entire View
Data Analytics
Sample - Supe...
Search
Tables
Orders
Column 1 Ca...
Column 2 Ca...
Customer ID
Customer N...
Location
Country/...
Region
State
City
Postal Code
Order Date
Order ID
Order Profita...
Product
Category
Sub-Cate...
Product N...
Product ID
Row 1 Categ...
Row 2 Categ...
Row ID
Segment
Ship Date
Parameters
Base Salary
Churn Rate
Commission Rate
New Business Gro...
New Quota
Pages
Filters
Marks
Automatic
Color
Size
Text
Tooltip
SUM(Sales)
Region
Columns
Column 1 Category
Column 2 Category
Sub-Category
Rows
Row 1 Category
Row 2 Category
1
2
3
Sheet 22
Column 1 Category / Column 2 Category / Sub-Category
Furniture
Office Supplies
Technology
Row 1 Cate..
Row 2 Cate..
Bookc..
Chairs
Furnis..
Tables
Applia..
Art
Binders
Envelo..
Fasten..
Labels
Paper
Storage
Suppli..
Access..
Copiers
Machi..
Phones
Consumer
Central $12,961 $42,933 $9,500 $20,835 $9,819 $3,272 $39,694 $2,365 $422 $743 $7,564 $24,672 $4,560 $19,062 $4,520 $12,000 $37,109
East $27,307 $59,645 $13,177 $14,082 $19,390 $3,847 $31,623 $2,096 $424 $1,653 $8,661 $24,994 $8,568 $22,861 $30,400 $30,668 $51,512
South $8,717 $26,804 $10,871 $24,409 $8,287 $2,655 $18,618 $1,192 $276 $1,868 $7,603 $16,882 $2,124 $11,652 $4,440 $18,339 $30,846
West $19,648 $43,480 $16,072 $40,607 $15,324 $4,478 $28,227 $2,119 $558 $2,445 $12,496 $33,944 $10,490 $33,530 $30,460 $18,536 $50,466
Corporate
Central $8,390 $27,990 $3,144 $12,563 $5,225 $1,479 $8,880 $1,236 $232 $1,095 $5,952 $12,657 $4,383 $6,195 $29,680 $11,717 $17,181
East $13,169 $23,505 $9,983 $17,552 $10,981 $2,278 $12,048 $1,579 $286 $509 $5,975 $30,968 $1,849 $11,748 $4,220 $23,892 $29,866
South $1,154 $11,367 $4,505 $12,620 $10,124 $1,332 $11,828 $1,471 $81 $365 $3,345 $11,362 $6,022 $10,175 $4,860 $12,001 $19,274
West $11,294 $36,279 $7,369 $28,138 $10,259 $3,501 $18,805 $1,657 $184 $2,133 $8,611 $24,804 $7,181 $20,072 $8,070 $12,667 $24,833
Home Office
Central $2,807 $14,308 $2,610 $5,757 $8,539 $1,014 $8,350 $1,036 $123 $613 $3,976 $8,602 $525 $8,699 $3,060 $3,081 $18,114
East $3,343 $13,110 $5,911 $7,506 $3,817 $1,360 $9,827 $701 $110 $442 $5,536 $15,650 $343 $10,424 $18,600 $11,546 $19,237
Select Column 1 Heading
Customer Segment
Select Column 2 Heading
Category
Select Row 1 Heading
Segment
Select Row 2 Heading
Region
Region
Central
East
South
West

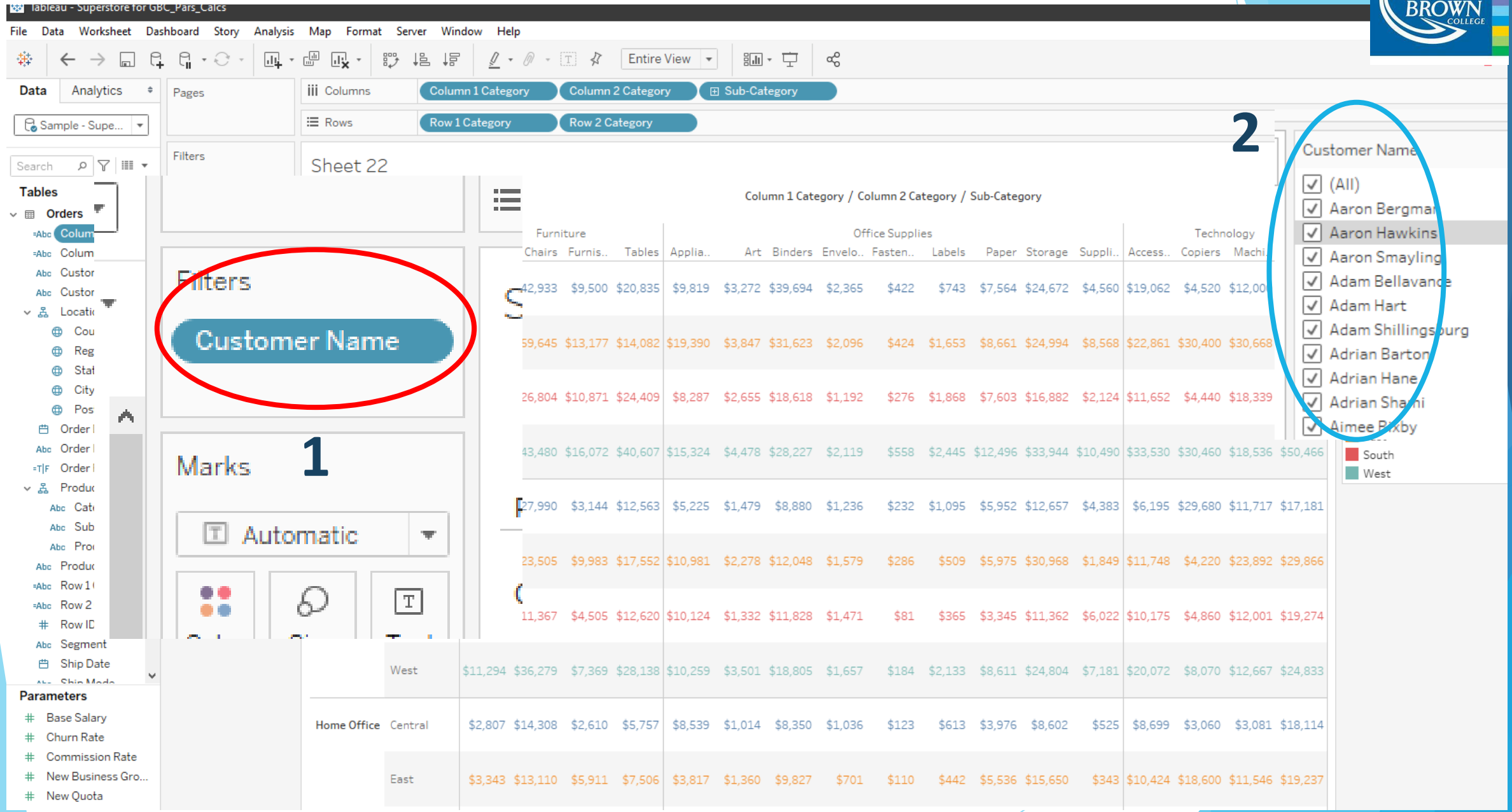
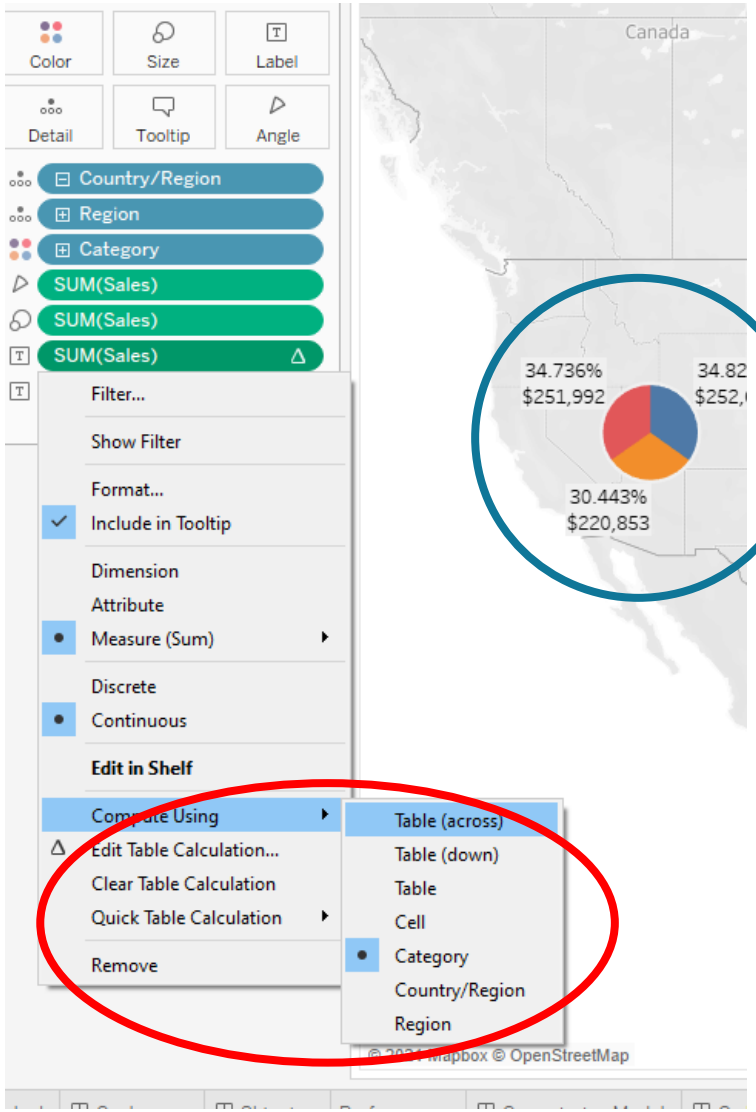
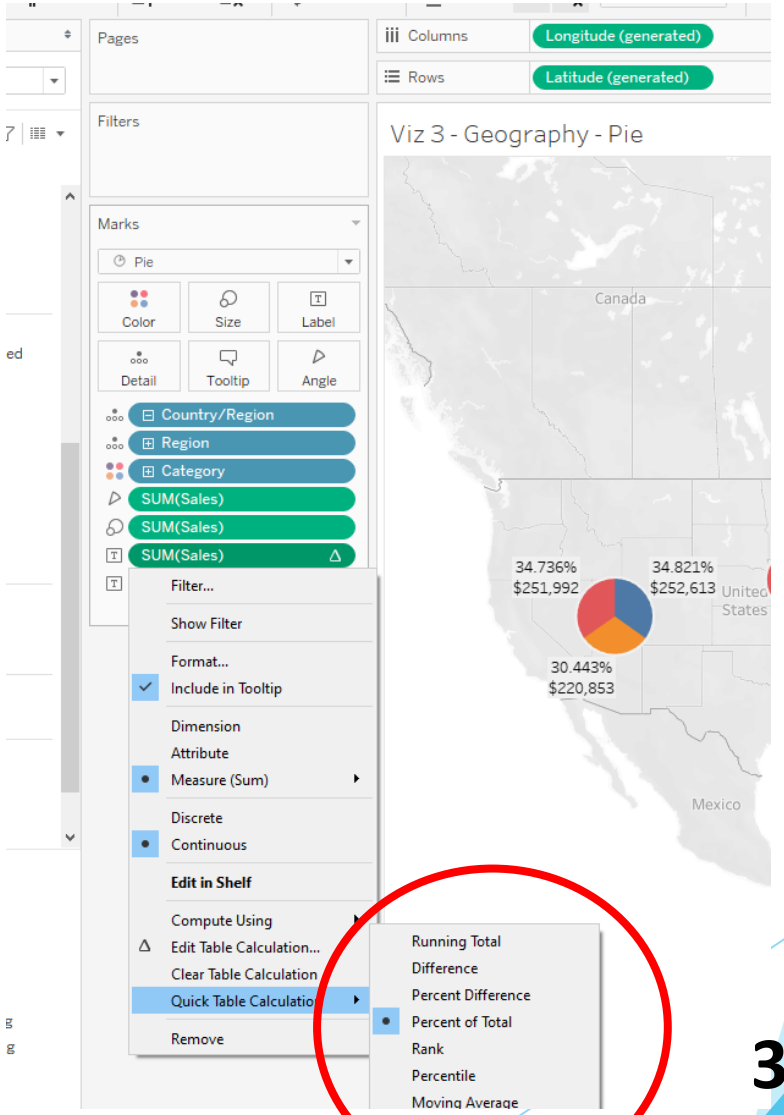


Tableau - Superstore for GBC_Pars_Calcs
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Entire View
Data Analytics
Pages
Columns Column 1 Category Column 2 Category Sub-Category
Rows Row 1 Category Row 2 Category
Filters
Sheet 22
Tables
Orders
Parameters
Base Salary
Churn Rate
Commission Rate
New Business Gro...
New Quota
Filters
Customer Name
Marks
1
Automatic
2
Column 1 Category / Column 2 Category / Sub-Category
Furniture
Office Supplies
Technology
Chairs Furnis.. Tables Applia.. Art Binders Envelo.. Fasten.. Labels Paper Storage Suppli.. Access.. Copiers Machi..
West $11,294 $36,279 $7,369 $28,138 $10,259 $3,501 $18,805 $1,657 $184 $2,133 $8,611 $24,804 $7,181 $20,072 $8,070 $12,667 $24,833
Home Office Central $2,807 $14,308 $2,610 $5,757 $8,539 $1,014 $8,350 $1,036 $123 $613 $3,976 $8,602 $525 $8,699 $3,060 $3,081 $18,114
East $3,343 $13,110 $5,911 $7,506 $3,817 $1,360 $9,827 $701 $110 $442 $5,536 $15,650 $343 $10,424 $18,600 $11,546 $19,237
Customer Name
(All)
Aaron Hawkins
Adam Hart
Adrian Hane
South
West

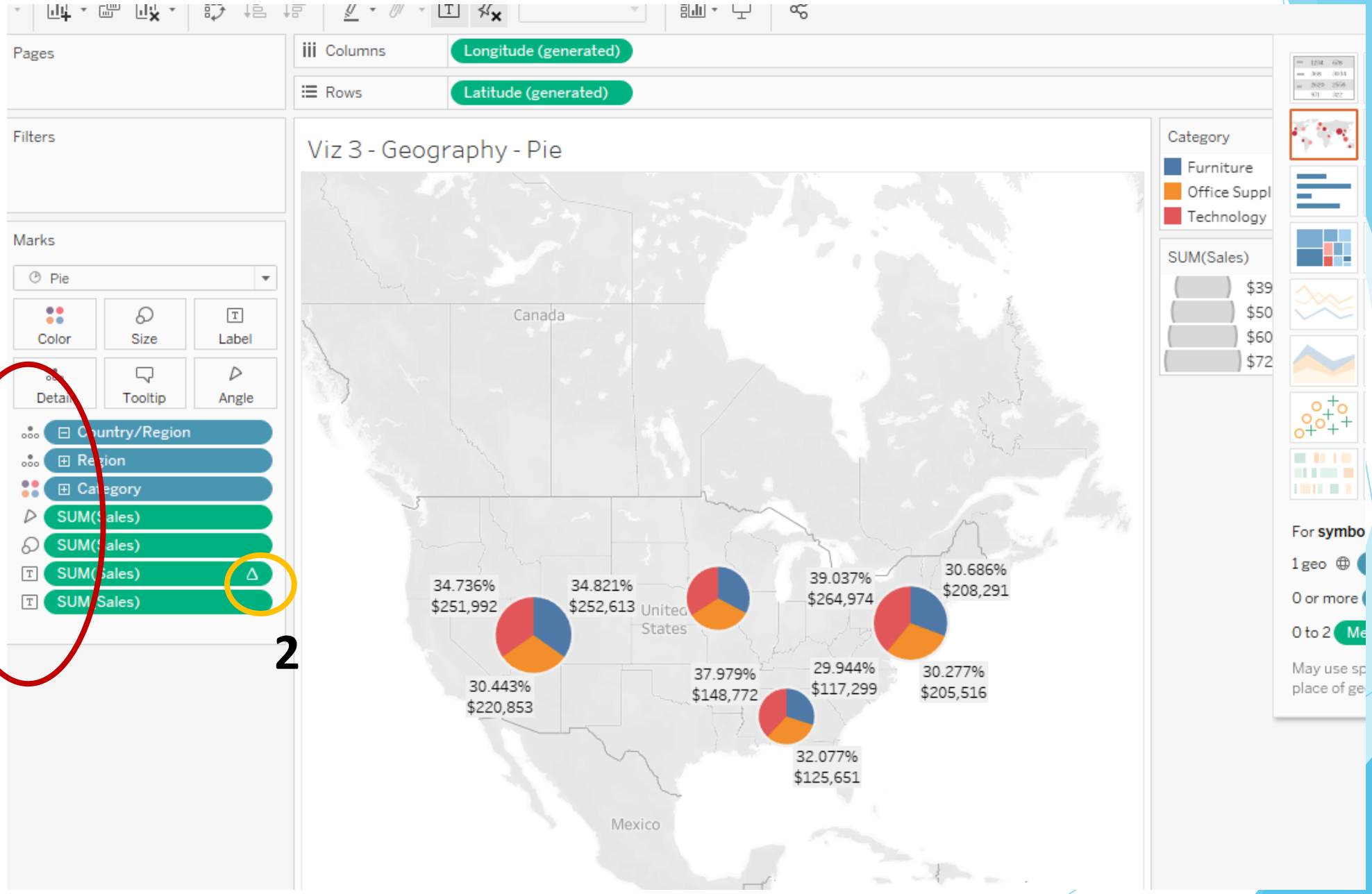

Color
Size
Label
Detail
Tooltip
Angle
Country/Region
Region
Category
SUM(Sales)
SUM(Sales)
SUM(Sales)
Filter...
Show Filter
Format...
Include in Tooltip
Dimension
Attribute
Measure (Sum)
Discrete
Continuous
Edit in Shelf
Compute Using
Edit Table Calculation...
Clear Table Calculation
Quick Table Calculation
Remove
Table (across)
Table (down)
Table
Cell
Category
Country/Region
Region
Canada
34.736%
$251,992
34.82
$252,
30.443%
$220,853
© Mapbox © OpenStreetMap

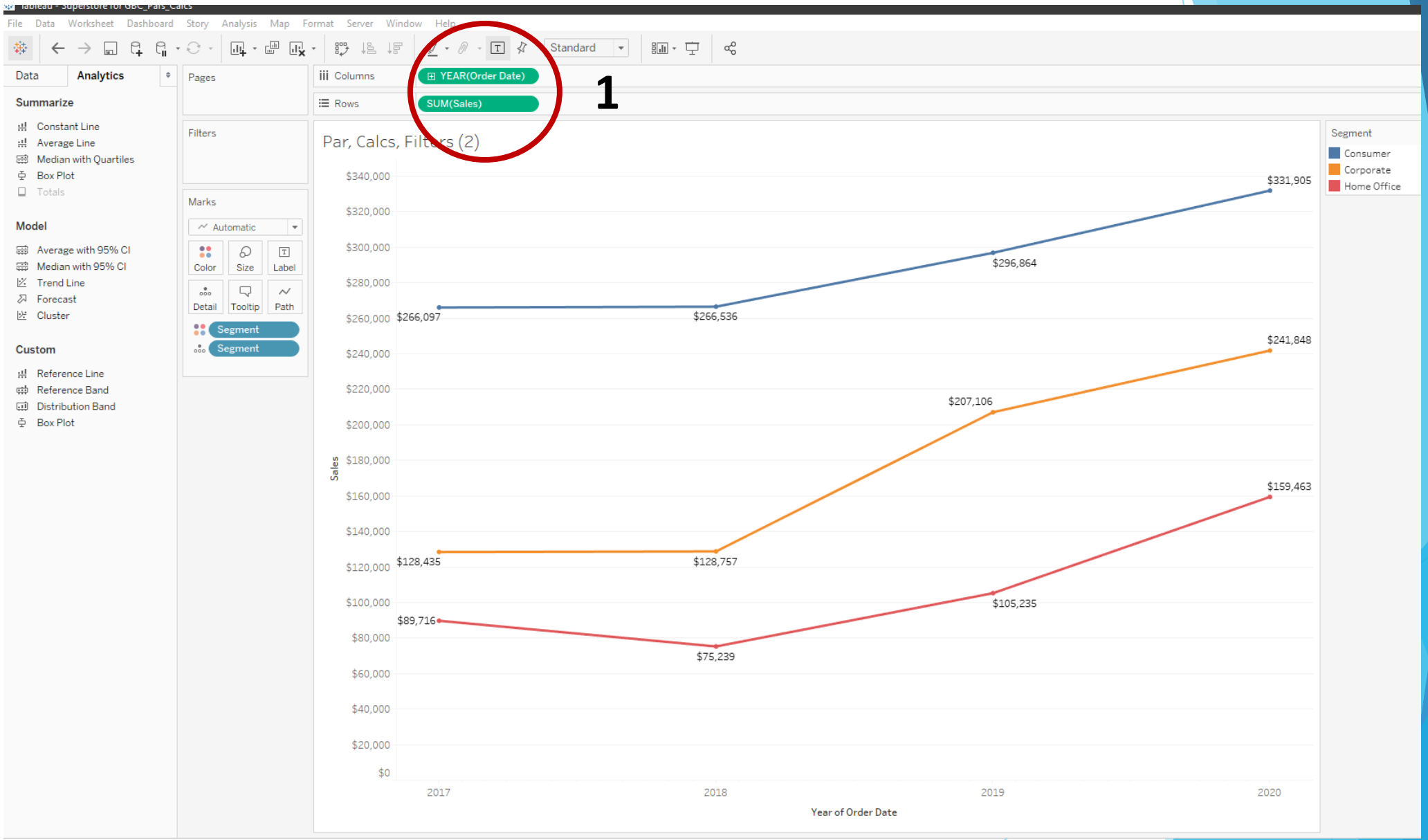
1


Pages
Filters
Marks
Pie
Color
Size
Label
Detail
Tooltip
Angle
Country/Region
Region
Category
SUM(Sales)
SUM(Sales)
SUM(Sales)
Filter...
Show Filter
Format...
Include in Tooltip
Dimension
Attribute
Measure (Sum)
Discrete
Continuous
Edit in Shelf
Compute Using
Edit Table Calculation...
Clear Table Calculation
Quick Table Calculation
Remove
Running Total
Difference
Percent Difference
Percent of Total
Rank
Percentile
Moving Average
Columns
Longitude (generated)
Rows
Latitude (generated)
Viz 3 - Geography - Pie
Canada
34.736%
$251,992
34.821%
$252,613
30.443%
$220,853
Mexico

2

3


Pages
Columns
Longitude (generated)
Rows
Latitude (generated)
Filters
Marks
Pie
Color
Size
Label
Detail
Tooltip
Angle
Country/Region
Region
Category
SUM(Sales)
SUM(Sales)
SUM(Sales)
SUM(Sales)
1
2
Viz 3 - Geography - Pie
Canada
United States
Mexico
34.736%
$251,992
34.821%
$252,613
39.037%
$264,974
30.686%
$208,291
30.443%
$220,853
37.979%
$148,772
29.944%
$117,299
30.277%
$205,516
32.077%
$125,651
Category
Furniture
Office Suppl
Technology
SUM(Sales)
$39
$50
$60
$72
For symbo
1 geo
0 or more
0 to 2
May use sp
place of ge


File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Standard
Data
Analytics
Summarize
Constant Line
Average Line
Median with Quartiles
Box Plot
Totals
Model
Average with 95% CI
Median with 95% CI
Trend Line
Forecast
Cluster
Custom
Reference Line
Reference Band
Distribution Band
Box Plot
Pages
Filters
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Path
Segment
Segment
Columns
YEAR(Order Date)
Rows
SUM(Sales)
1
Par, Calcs, Filters (2)
Segment
Consumer
Corporate
Home Office
$340,000
$320,000
$300,000
$280,000
$260,000
$240,000
$220,000
$200,000
$180,000
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
Sales
$331,905
$296,864
$266,097
$266,536
$241,848
$207,106
$159,463
$128,435
$128,757
$105,235
$89,716
$75,239
2017
2018
2019
2020
Year of Order Date